"Small Scale Demonstration facility for refining and bio-conversion of lignocellulosic residues into ethanol and co-products sanctioned to IIT, New Delhi, during the year 1985-86 which has been mentioned as production of alternate fuels from agro-wastes" in the aforesaid Question. The Pilot project, with an installed capacity of 50 litres per day of lignocellulosic materials (rice straw), was successfully commissioned by IIT Delhi on 20-11-91. Since then the Plant has been run in 4 batches. Recently, some leakage problem has developed in the bio-reactors. Intensive efforts are on to overcome this problem.

Wind power generation

4793. SHRI B. K. HARIPRASAD: Will the PRIME MINISTER be pleased to state:

(a) whether it is a fact that the wind power generation continues to be tardy in the country as reported in the Economic Times' dated 4th July, 1992;

(b) what is the installed capacity so far and actual generation both in terms of MW State-wise;

(c) whether it is a fact that there is still considerable potential untapped in the country and if so, what is the estimated and actually exploited potential in terms of MW State-wise;

(d) whether Government are aware that in the Western countries, as per reports in the Wind Power monthly from Denmark, there is now a move towards installation of windpower from on-shore points and if so, whether similar plans have been formulated for India; and

(e) if so, the details thereof?

THE MINISTER OF STATE OF THE MINISTRY OF PLANNING AND PROGRAMME IMPLEMENTATION AND MINISTER OF STATE IN THE MINISTRY OF NON-CONVENTIONAL ENERGY SOURCES (SHRI SUKH RAM): (a) The article titled 'Harnessing Wind Power' which appeared in the 'Economic Times' of 4th July, 1992, gives an overall scenario of wind power development in the country and does not state that the wind power generation in the country is tardy. The Ministry of Non-Conventional Energy Sources is implementing the wind energy programme comprising wind surveys, wind pumps, wind battery chargers and grid-connected wind power projects. A resource database for wind energy is being builtup through wind survey covering 21 States/UTs. Wind power projects of aggregate capacity of about 43 MW have so far been installed in 9 States, including private sector projects. In addition, 2900 wind pumps and over 100 small wind battery charges have been installed in different parts of the country under the wind energy domonstration programme.

(b) The State-wise installed wind power capacity and cumulative generation as of july, 1992 is given below:

State	Aggregate Installed capacity (MW)	Cumulative Genalration (Million Kwh)
Tamil Nadu	22.53	92.31
Maharashtra	16.30	3.69
Orissa	1.19	1.18
Madhya Pradesh	0.59	1.60
Andhra Pradesh	0.55	1.16
Karnataka	0.55	..
Goa	0.11	0.06
Kerala	0.10	0.08

(c) According to a preliminary assessment the wind power potential in the country is estimated to be over 20,000 MW. Wind Sprveys are being undertaken in 21 States/UTs with a view to identifying windy regions and to assess the wind power potential. So far, Gujarat, Andhra Pradesh, Tamil Nadu and Karnataka are known to have significant wind potential. Preliminary estimates of potential in Tamil Nadu and Gujarat are placed at 5,000 MW each. Recent estimate of potential in the Southern Region of Andhra Pradesh is about 800 MW. The actually exploited potential is given above in the reply to part (b).

(d) and (e) Yes, Sir. The Government is aware that the first offshore windfarm in the world has been build in the island of Holland, Denmark. However, there is no proposal at present to build an off-shore wind farm project in the country.

Sources of energy

4794. SHRI TINDIVANAM G. VENKATARAMAN: Will the PRIME MINISTER be pleased to state:

(a) what are the other sources of power production apart from solar energy; and

(b) whether solar energy production would meet the future demands of energy?

THE MINISTER OF STATE OF THE MINISTRY OF PLANNING AND PROGRAMME IMPLEMENTATION AND MINISTER OF STATE IN THE MINISTRY OF NON-CONVENTIONAL ENERGY SOURCES (SHRI SUKH RAM): (a) In addition to Sloar Energy, power is produced through Wind, Mini-Micro Hydro and Biomass, which are renewable, dependable and widely available sources of energy. The non-conventional energy power generation projects/system of about 147 MW aggregated capacity have been installed upto March, 1992. The status of installation of power eneration units based on various renewable energy sources including Solar Energy and likely installation to be taken up during 1992-93 is given in the attached statement. (*See* beow)

(b) The country receives Solar Energy equivalent to about 5,000 trillion KWhr per year in aggregate terms. Low temperature Solar Thermal technologies have been developed and ar being utilised for meeting heating requirements in various sectors of utilisation for domestic, industrial, commercial institutional and community applications. With the large scale dissemination and continuous upgradation of these technologies, it may become possible to largely meet heating energy requirements in different sectors.

The prospects of power production from Solar Energy will depend on the availability of technology that can convert Solar Energy into electricity in a cost effective manner. At present, Solar Photovoltaic power systems are cost effective in only remote, unelectrified areas for small power applications. Similarly, thermal route for generation of power from Solar Energy, presently, is also costlier. With research & development and improvements in technologies and increased production of equipments, reduction in cost is expected and consequently the prospects of power production from Solar Energy to meet the futre demands of energy to meet the future demands of energy are expected to improve.